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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,372	09/29/2003	Frederick Haubensak	42P15995	5201

8791 7590 03/17/2006

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EXAMINER	
ELVE, MARIA ALEXANDRA	
ART UNIT	**PAPER NUMBER**
1725	

DATE MAILED: 03/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/674,372	HAUBENSAK, FREDERICK	
	Examiner	Art Unit	
	M. Alexandra Elve	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-23 and 25-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-23 and 25-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 7, 12-23, 25 & 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Reinhardt (USPN 6,747,243).

Reinhardt discloses a method and apparatus for selectively removing contaminant particles from a substrate (e.g. semiconductor wafer). The system scans the substrate surface to detect and identify any defects on the substrate surface and then software analyses the scanned data to determine characteristics of the defect and the planar x, y coordinates of each defect. This data is used to determine which defects should be removed. The laser uses the x, y coordinates to remove the contaminant while not substantially treating or directly contacting the area surrounding the contaminant thereby damaging or altering the substrate surface.

A femtosecond laser is used to remove the defects. The laser emits a beam having a diameter substantially the same size as a diameter of the defect in order to remove the defect. Laser beam diameters range from about 0.1 um to 0.25 um. The laser beam removing the defect at a rate that is faster than the substrate heating rate and thus avoids substrate surface damage. Defects may be removed using ablation. Particle size of the contaminants which are removed from the substrate having

diameters as low as 0.1 um or even lower and those contaminants having diameters up to about 0.25 um or higher. The laser sends out pulses at 100 x 10^{-15} seconds, that is, it emits short pulses than last 50 to 1,000 femtoseconds and thus avoids possible surface damage to the substrate. (abstract, figures, col. 5, lines 20-62, col. 6, lines 8-22, col. 7, lines 26-33, col. 10, lines 61-67, col. 11, lines 1-50)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8-11 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhardt, as stated in the above paragraph and further in view of Allen et al. (USPAP 2004/0182416 A1).

Reinhardt does not teach explosive evaporation, the angle of incidence or automatic alignment and focusing.

Allen et al. discloses a method and apparatus for removing minute particles from a substrate. The apparatus tailors the energy pulses in order to remove the contaminants from the surface of a semiconductor wafer. Low pulsed laser energy density is used to remove particulate material. Explosive evaporation is used to remove particles with substantial force, that is, a thermal expansion velocity removes the

particle. The pulse length of the energy and spacing of the pulses is preferably sufficiently short in order to achieve the desired temperature distribution of the energy transfer medium but not shorter in order to decrease the likelihood of substrate damage. Cleaning entails focusing the laser beam of the area of interest at approximately a 30-degree angle of incidence. The radii of particles cleaned from the surface range from 0.25 to 0.55 um. (abstract, figures, 0002, 0005, 0009, 0010-0014, 0018, 0033, 0039, 0041, 0048, 0052-0053, 0055-0056, 0059, 0065-0066, 0068, 0074-0076, 0103)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use explosive evaporation as taught by Allen et al. in the Reinhardt system because the removal technique may minimize damage to the wafer surface.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the angle of incidence (30 degrees) as taught by Allen et al., in the Reinhardt system because it ensures the optimal removal of contamination.

The provision or mechanical or automated means to replace manual activity was held to have been obvious. In re Venner 120 USPQ 192. It would have been obvious to automate alignment and focusing.

Response to Amendment

Applicant's arguments filed 11/16/05 have been fully considered but they are not persuasive. Applicant argues that the prior art does not fall within applicant specifications definition of ablation. The examiner respectfully notes that Where

applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "ablation" in the claims is used to mean "evaporation and fragmentation of a particle", while the accepted meaning is "the removal of material from the surface of an object by vaporization, evaporating, chipping, abrading, cutting OR other erosive processes." The term is indefinite because the specification does not clearly redefine the term. The definition stated above is the generally accepted definition, the examiner respectfully submits that applicant has so severely restricted the definition that it has come of a point where it has lost its meaning. The restriction of the term appears to be merely a tool to "get around" or invalidate the prior art references.

Furthermore, applicant states that the prior art reference (Reinhardt) simply removes defects and does not use ablation. The examiner respectfully disagrees because: "defects may be removed using ablation". The reference must be read and interpreted in the broadest terms, one cannot pick and choice specific embodiments.

The examiner respectfully submits that In response to applicant's argument that Allen simply teaches pulling particles off, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the

references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 15, 2006.

M. Alexandra Elve
Primary Examiner 1725